NATURAL RESOURCE TECHNOLOGY

TECHNICAL MEMORANDUM

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Date: September 27, 2010

To: Naren Prasad and Brian Bartoszek, Integrys Business Support

From: Sarah Meyer and Jennifer Kahler, Natural Resource Technology, Inc.

Subject: Supplement to *Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP Sites*

This Technical Memorandum present supplemental details for the *Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch Manufactured Gas Plant (MGP) Sites, Revision 1* (Exponent, August 2009) based on in-river observations and reconnaissance. United States Environmental Protection Agency (USEPA) approved the original document on April 20, 2010 as part of (Appendix F) of the *Division Street Operable Unit (OU) Site Specific Work Plan (SSWP) – Revision 1*. This supplement to the original document is presented for USEPA's review and comment and provides the approach to characterize ambient sediment conditions upstream from the former MGPs at the Division Street, Hawthorne Avenue, Willow Street, and North Station sites (the North Branch MGP sites). The characterization activities will be performed in accordance with the Administrative Order on Consent (AOC) and Statement of Work (SOW), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Docket No. V-W-08-C-917, dated October 31, 2008.

On July 7, 2010, a field reconnaissance of the ambient reach of the North Branch Chicago River was performed on behalf of Integrys Business Support (IBS) by Sarah Meyer of Natural Resource Technology, Inc. (NRT), Michael Kierski of Exponent, Inc, (Exponent), and Amy Hanrahan of Burns and McDonnell Engineering, Inc. United States Environmental Protection Agency (USEPA) Region 5 performed oversight during the reconnaissance. USEPA oversight team members included Chuck Roth, USEPA Field Environmental Decision Support (FIELDS) group, and Renee Clore, CH2M Hill. The objective of the field reconnaissance was to identify and map all visible outfalls and potential source areas in the pre-selected 1.3 mile ambient reach of the North Branch Chicago River upstream of the North Branch MGP sites.

Observations from the field reconnaissance were used to select field sampling locations based on a sampling scheme described in the USEPA-approved *Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP Sites*.

Field Reconnaissance

The field team toured the ambient reach of the North Branch Chicago River by pontoon boat and recorded the location of outfalls and other potential source areas (e.g., scrap metal recycling facilities and a treated wood bridge) using a handheld Global Positioning System (GPS) unit. Photos of the features were also taken and a log describing each feature was recorded. The location of each feature is approximate as they were recorded by the GPS unit while on board the boat which was floating in the river near the feature.

Table 1 includes the position and description of the features identified during the field reconnaissance. The approximate position of each feature is depicted on Figure 1. A photo log showing details of the source area features is included as Enclosure A.

Proposed Sampling Locations

Based on the results of the reconnaissance, sampling locations have been selected for characterization of ambient conditions. Section 2.2 of the USEPA-approved *Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP Sites* specifies the methods and potential sampling schemes to be used to select a minimum of 5 source-area and 20 ambient sediment samples for characterization of conditions in this reach of the river. Selected locations and selection rationale are presented below.

Proposed Non-MGP Source Sampling Locations

It is recognized that within the ambient reach of the river there may be influences from specific urban non-MGP sources (e.g., major stormwater outfalls or facilities that have used or are currently using coal-tar or petroleum-based materials). Outfalls, areas and features located adjacent to or draining from potential non-MGP sources have been identified on Table 1. These locations are related to one or more of the following potential point sources (i.e., outfalls) or area sources:

- The General Iron scrap metal processing facility and a loading chute at the dock of this facility;
- The Metals Management scrap metal facility;
- A crane/clamshell hoist on the dock at the property north of the Webster Avenue Aeration Station;
- A creosote-treated wooden bridge/train trestle;
- A cement facility with unknown outfalls along the river blocked by barge traffic; or
- A number of combined sewer overflow (CSO) or storm sewer outfalls.

Some of these locations, and some additional locations, are also near historic non-MGP industrial/commercial facilities that may have been source areas at one time. These locations have an "HSX" identifier in the "Description" column of Table 1, where "X" changes depending on what type of

historic facility was nearby. There were fifteen locations near these historic facilities. The locations of historic facilities are also displayed on Figure 1.

Based on results of the site reconnaissance and an evaluation of the potential point source and source areas (i.e., current or historic), 11 locations have been selected for non-MGP source area sampling. These sampling locations are presented on Figure 2 and Table 2. A single source sampling location was placed at outfalls of interest, such as locations SCR-01 and SCR-06; two sampling locations were placed at non-MGP source areas of interest, such as near locations SCR-02/-03 and SCR-04/-05. Samples were selected primarily from the non-MGP source areas in the downstream sections of the reach, because they are more likely to influence contaminant concentrations at the North Branch sites due to proximity. Non-MGP source samples from the upstream portions of the ambient reach were also included to provide a broad understanding of the sources within this reach and to include the range of identified potential sources of polycyclic aromatic hydrocarbons (PAH) to the ambient reach.

Proposed Ambient Sampling Locations

Based on the spatial distribution of the numerous outfalls and source areas in this stretch of the river, as described above, the ambient sampling locations were selected to provide good spatial representation of general river conditions upstream of the North Branch MGPs. Two possible sampling schemes were described in Section 2.2 of *Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP Sites.* Due to the number of potential non-MGP source areas identified within this reach of the Chicago River, it has been determined that a combination of the proposed sampling schemes would provide the best information.

The proposed ambient sampling locations are divided among pre-selected, random locations within the river polygons identified in the USEPA approved *Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP Sites.* As described in that document, this reach of the river has been divided into polygons that are 100-meters long, and span from bank to bank; then the polygons are sub-divided into nearshore and mid-channel segments. The polygons are labeled A through U and each polygon is sub-divided into two nearshore and two mid-channel segments; these features are shown on Figures 1 and 2. The selected ambient sampling locations within the polygons, and spaced out by the subdivided segments, are shown on Figure 2 and Table 3 and were chosen for the following reasons:

- Twenty primary ambient sampling locations have been selected (locations 1-20). In these cases, the entire polygon is free of potential source outfalls or areas and four sampling locations were selected within that polygon. Five polygons and 20 samples fall into this category.
- Eight alternate ambient sampling locations were also selected based on distance from potential sources (locations 21-28). It is expected that it will be difficult to recover sediment from some of the primary sampling locations due to the position of in-river barges, sediment conditions, etc. To ensure collection of a 20-sample set, these alternate locations were pre-selected to allow the field team to skip primary sampling locations that they are not able to sample.

Sampling will proceed from downstream to upstream for the primary sampling locations. If 20 samples cannot be collected from primary sampling locations, sampling will begin again from downstream to

upstream at the alternate sampling locations until 20 pre-selected locations have been sampled (10 nearshore and 10 main channel surface samples). Vertical profile sampling locations, along with alternates, are identified on Figure 2. Ambient samples that will also be sampled for sediment toxicity testing are identified in Table 3. All sampling locations were selected to represent both mid-channel and nearshore areas throughout the ambient reach of the river.

Surface sediment samples will be collected using a push-corer, with repeated deployments at the same location for samples that require additional volume (e.g. toxicity sampling locations). Vertical profile sediment samples will be collected using a CME 55 LC barge-mounted drill rig and 2- and 3-inch diameter split spoons. Alternative methods, such as ponar and sonic drill for the surface and vertical profile sampling, respectively, may be used if the primary sampling method is unavailable due to subcontractor availability or not viable for another reason.

Additional sampling details, including sampling depth, procedures for toxicity sampling and analysis and other laboratory analyses, and field procedures can be found in the USEPA-approved *Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP Sites.*

References

Burns and McDonnell, 2009. Division Street Station OU Site Specific Work Plan, September 2009.

Exponent, Inc., 2009. *Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP Sites, Revision1,* August 2009.

USEPA, 2010. Approval of Site-specific Work Plan, Division Street Operable Unit (Revision 1), April 2010.

Attachments:

Figures

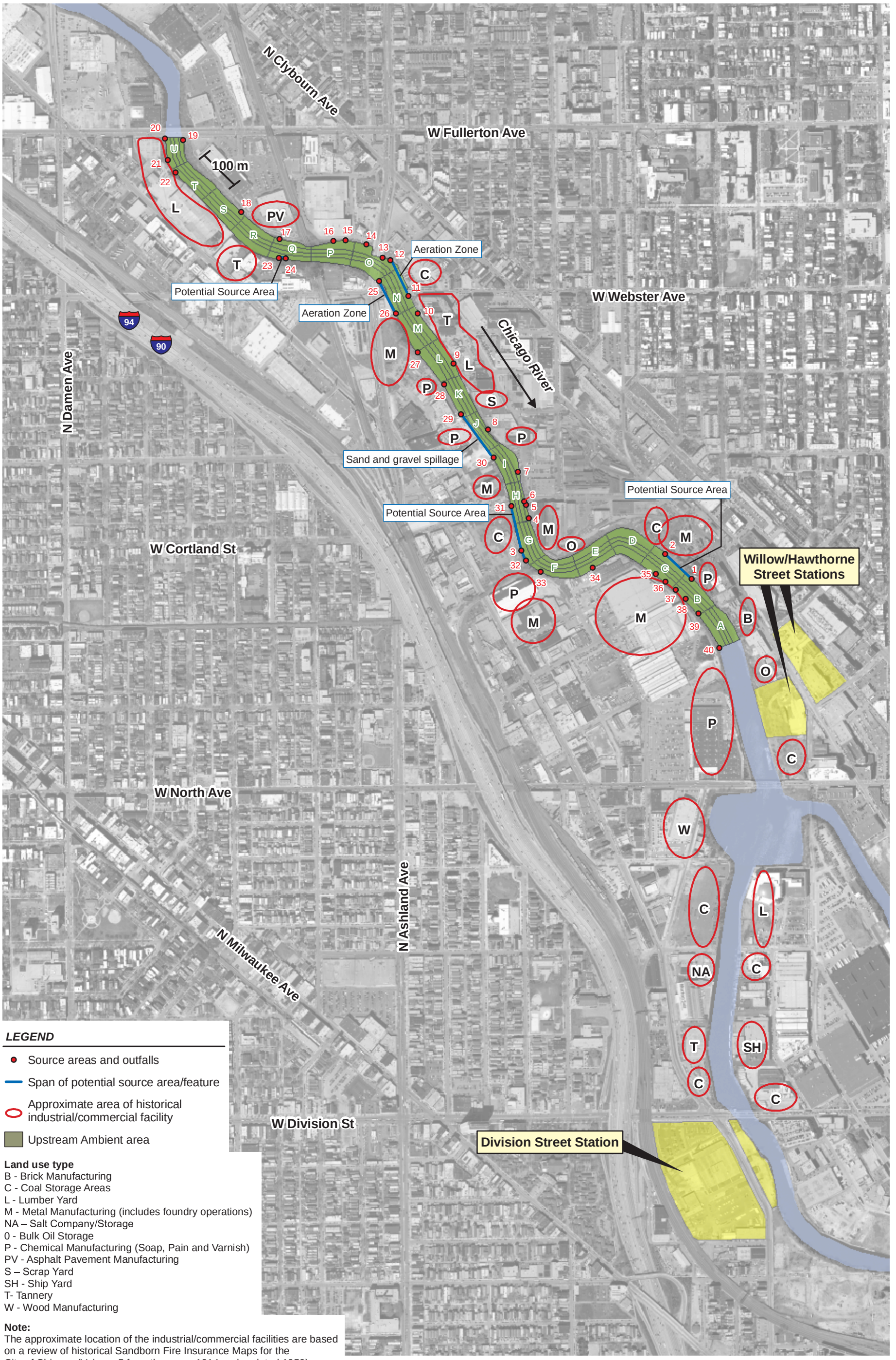
- Figure 1: 2010 Reconnaissance Features – North Branch Chicago River, Ambient Reach
- Figure 2: 2010 Proposed Sampling Locations – Characterization of Ambient Conditions, North Branch Chicago River

Tables

- Table 1: 2010 Reconnaissance Features – North Branch Chicago River, Ambient Reach
- Table 2: 2010 Proposed Source Sampling Locations
- Table 3: 2010 Proposed Ambient Sampling Locations

Enclosure A: Photo Log of Source Area Features

Figures



LEGEND

- Source areas and outfalls
- Span of potential source area/feature
- Approximate area of historical industrial/commercial facility
- Upstream Ambient area

Land use type
B - Brick Manufacturing
C - Coal Storage Areas
L - Lumber Yard
M - Metal Manufacturing (includes foundry operations)
NA – Salt Company/Storage
0 - Bulk Oil Storage
P - Chemical Manufacturing (Soap, Pain and Varnish)
PV - Asphalt Pavement Manufacturing
S – Scrap Yard
SH - Ship Yard
T- Tannery
W - Wood Manufacturing

Note:
The approximate location of the industrial/commercial facilities are based on a review of historical Sandborn Fire Insurance Maps for the City of Chicago (Volume 5 from the years 1914 and updated 1950).

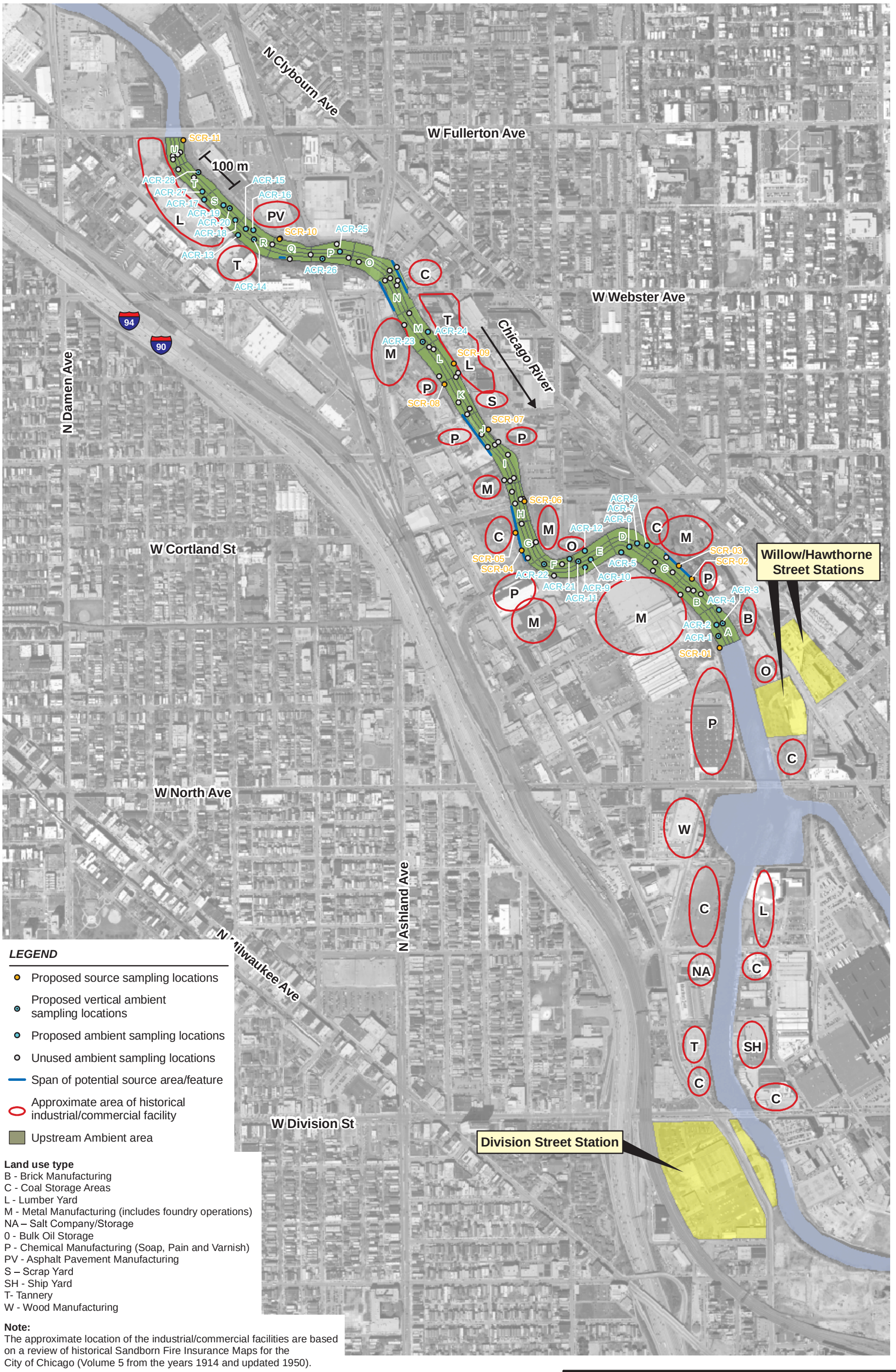
Exponent®

Source: Aerial photograph form USGS (2006).

0 750 1,500 Feet

0 250 500 Meters

Figure 1. 2010 Reconnaissance Features
North Branch Chicago River - Ambient Reach



LEGEND

- Proposed source sampling locations
- Proposed vertical ambient sampling locations
- Proposed ambient sampling locations
- Unused ambient sampling locations
- Span of potential source area/feature
- Approximate area of historical industrial/commercial facility
- Upstream Ambient area

Land use type
B - Brick Manufacturing
C - Coal Storage Areas
L - Lumber Yard
M - Metal Manufacturing (includes foundry operations)
NA – Salt Company/Storage
0 - Bulk Oil Storage
P - Chemical Manufacturing (Soap, Pain and Varnish)
PV - Asphalt Pavement Manufacturing
S – Scrap Yard
SH - Ship Yard
T- Tannery
W - Wood Manufacturing

Note:
The approximate location of the industrial/commercial facilities are based on a review of historical Sandborn Fire Insurance Maps for the City of Chicago (Volume 5 from the years 1914 and updated 1950).

Exponent®

Source: Aerial photograph form USGS (2006).

0 750 1,500 Feet

0 250 500 Meters

Figure 2. 2010 Proposed Sampling Locations Characterization of Ambient Conditions North Branch Chicago River

MY03195 | September 2010 | M:\MY03195_ChicagoMGP\projects\Figure 2 2010 proposed locations.mxd

Tables

Table 1 - 2010 Reconnaissance Features – North Branch Chicago River, Ambient Reach

Technical Memorandum - Supplement to Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP

Outfall/ Feature	Polygon	Easting (UTM)	Northing (UTM)	Photo Number	Bank Location	Location Description	Feature Description
1	B	445340	4640578	070710-01	East	O, AS, HSM	Medium-sized, dry pipe south of General Iron (GI) processing plant
2	B	445264	4640624	070710-02	East	O, AS, HSM	Loading chute over river at GI; combined sewer overflow (CSO) outfall nearby, according to City of Chicago
3	G	444949	4640659	070710-03	West	AS, HSM	Metals Management on west side of river, scrap yard, south end of yard
4	H	444940	4640729	---	East	O	Suspected intake/outfall (approximately 30 feet from each other in this area) east side river at Finkl property
5	H	444931	4640761	---	East	O	Southeast corner of Cortland bridge; small outfall under bridge
6	H	444933	4640759	070710-04	East	O	CSO outfall, "netted", medium-sized, northeast corner of Cortland bridge, Outfall #080
7	I	444911	4640841	---	East	O	Small drain tile, formerly buried, north of Cortland bridge; a few more small pipes sticking out of eroded cutface 15 feet north of here, too
8	J	444847	4640948	070710-05	East	O	CSO outfall #078, medium-sized; brick building and palette loading at this property
9	L	444757	4641106	070710-06	East	O, HST	Small, historic outfall, grown over with vegetation now; steel guardrail at land edge here
10	M	444673	4641232	070710-07	East	O, HST	Small, historic outfall, vegetation growing out of it
11	N	444636	4641273	070710-08	East	O	Box culvert, southeast corner of Webster bridge, CSO/storm sewer; aeration station upstream of here

Outfall/ Feature	Polygon	Easting (UTM)	Northing (UTM)	Photo Number	Bank Location	Location Description	Feature Description
12	O	444604	4641357	070710-09	East	O	Crane/clamshell hoist at shore just north of aeration station
13	O	444582	4641365	---	East	O	Medium-sized outfall, southeast corner of Ashland Avenue bridge, possible storm sewer
14	O	444546	4641390	---	East	O	Medium-sized outfall through seawall, northeast side of Ashland Avenue bridge
15	P	444495	4641402	---	East	O	Medium-sized outfall pipe in seawall; appears to be at a garbage transfer facility
16	P	444467	4641403	---	East	O	Medium-sized outfall pipe in seawall; appears to be at a garbage transfer facility; submerged, rusted drum in water near outfall
17	Q	444335	4641414	070710-10	East	O, HSPV	Small, orange, clay(?), drain tile under tree roots at shoreline
18	R	444238	4641476	---	East	O	Medium-sized (approximately 18 inch) concrete outfall pipe from sheet pile wall at wall with tractor tires mounted for docking
19	U	444092	4641654	070710-11	East	O	Very large, two-box storm/CSO outfall with control gates at southeast corner of Fullerton Avenue bridge
20	U	444054	4641660	---	West	O	Very large (4-5 feet diameter) culvert under Fullerton Avenue bridge
21	U	444069	4641610	---	West	O	Very large (4 feet oblong) corrugated metal outfall coming out of wood seawall
22	U	444080	4641577	---	West	O	Very large outfall (4 feet oblong) located up inlet from feature 21, may be connected to feature 21
23	Q	444335	4641372	070710-12	West	O, AS, HST	Small (6-inch) outfall in concrete block near treated wood bridge; maybe creosote source

Outfall/ Feature	Polygon	Easting (UTM)	Northing (UTM)	Photo Number	Bank Location	Location Description	Feature Description
24	Q	444350	4641360	070710-13	West	O, AS, HST	Large, box "overflow" under same wood bridge of feature 22; parking lot upland from here
25	N	444580	4641315	---	West	O	Multiple, small (less than 4-inch) outfall pipes at southwest corner of Ashland Avenue bridge; aeration station begins downstream of here
26	M	444632	4641238	---	West	---	Southwest/downstream edge of Webster Avenue Aeration station
27	L	444681	4641141	070710-14	West	O, HSM	Small (4-6 inch) pipe from crumbling concrete foundation
28	K	444746	4641063	070710-15	West	O, HSP	Small outfall just upstream of concrete/foundation block; maybe PVC
29	K	444794	4640992	070710-16	West	AS, HSP	North edge of cement facility with large loading dock; barges docked here, wall/outfalls not visible; EPA stated that the river is full of gravel and sand here from offloading spillage
30	G	444872	4640885	070710-16	West	AS, HSP	South edge of cement facility and loading dock
31	G	444904	4640760	070710-17	West	O, AS, HSM	CSO #079, large (2 feet diameter), southwest corner of Cortland Avenue Bridge; Metals Management scrap metal yard downstream of here
32	F	444938	4640627	070710-18	West	O, AS	Medium-sized (18-inch) metal pipe approximately 20 feet south downstream end of Metals Management scrap yard wall; stormwater seepage over scrap yard wall
33	F	444978	4640605	070710-19	West	O, HSP	Midpoint between two medium-sized (18 inch) outfalls on sheet pile wall (north outfall in photo)

Outfall/ Feature	Polygon	Easting (UTM)	Northing (UTM)	Photo Number	Bank Location	Location Description	Feature Description
34	E	445097	4640620	---	West	O	Small (8-inch) pipe sticking through sheetpile wall at industrial facility
35	C	445256	4640594	---	West	O, HSM	Large (2.5 feet diameter) steel outfall off sheet pile wall at well-kept facility (maybe ComEd)
36	C	445280	4640575	070710-20	West	O, HSM	Medium (1-foot diameter) outfall (maybe ComEd)
37	C	445305	4640555	070710-20	West	O, HSM	Medium (1-foot diameter) outfall (maybe ComEd)
38	B	445329	4640533	070710-20	West	O, HSM	Midpoint of 2 medium (1-foot diameter) outfalls (maybe ComEd)
39	A	445362	4640497	070710-21	West	O, HSM	Medium-sized outfall with water running from it (maybe ComEd)
40	A	445413	4640413	070710-22	West	O	Large, corrugated outfall underneath a foundation, partially obstructed by wood seawall

Notes:

Polygon A – U - 100-meter blocks in alphabetical order starting at the southern end of the study area

CSO - Combined sewer overflow

GI - General Iron

HSM - Potential historic source area - metals manufacturing

HSP - Potential historic source area - chemical manufacturing

HSPV - Potential historic source area - asphalt pavement manufacturing

HST - Potential historic source area - tannery

O - Outfall or point source

AS - Potential source area

Outfall Size Details: Small-sized outfall is 6 inches in diameter or less; medium-sized outfall greater than 6 inches but less than 2 feet in diameter; large-sized outfall is 2 feet or greater in diameter, but less than 4 feet in diameter ; very-large-sized outfall - those with a diameter greater than 4 feet.

Outfall diameters are approximations based on field observation taken from a boat, no actual measurements were taken.

Coordinates are in UTM NAD83 meters zone 16N.

Table 2 - 2010 Proposed Source Sampling Locations

Technical Memorandum - Supplement to Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP Sites

Sample Number/Location	River Polygon	Cross-referenced Feature[1]	Northing	Easting	Source Outfall/Area
SCR-01	A	40	445412	4640413	Large outfall in most downstream polygon
SCR-02	B	1, 2	445343	4640582	Near bank at General Iron scrap metal facility; CSO nearby
SCR-03	C		445312	4640614	
SCR-04	G	3, 31, 32	444927	4640651	Near bank at Metals Management scrap metal yard
SCR-05	G		444912	4640695	
SCR-06	H	6	444934	4640772	Medium-sized CSO outfall
SCR-07	J	8	444845	4640947	Medium-sized CSO outfall
SCR-08	K	28	444738	4641058	Small outfall near bank at historic chemical manufacturing facility
SCR-09	L	9	444760	4641109	Small outfall near bank downstream of historic tannery
SCR-10	Q	17	444334	4641414	Small outfall near bank at historic asphalt pavement manufacturing facility
SCR-11	U	19	444098	4641656	Very large outfall, CSO, with control gates

Notes:

[1] Features shown on Figure 1 and Table 1

Polygon A – U - 100-meter blocks in alphabetical order starting at the southern end of the study area

CSO - Combined sewer overflow

Outfall Size Details: Small-sized outfall is 6 inches in diameter or less; medium-sized outfall greater than 6 inches but less than 2 feet in diameter; large-sized outfall is 2 feet or greater in diameter, but less than 4 feet in diameter; very-large-sized outfall - those with a diameter greater than 4 feet.

Outfall diameters are approximations based on field observation taken from a boat, no actual measurements were taken.

Coordinates are in UTM NAD83 meters zone 16N.

Samples are listed in most downstream to most upstream locations.

Table 3 - 2010 Proposed Ambient Sampling Locations
Technical Memorandum - Supplement to Characterization of Ambient Conditions in the Chicago River Upstream of the North Branch MGP Sites

Sample Number	River Polygon	Northing	Easting	Description	Location
ACR- 1	A	445409	4640442	Pri, V, T	NS
ACR- 2	A	445404	4640469	Pri	MC
ACR- 3	A	445419	4640473	Pri, V, T	MC
ACR- 4	A	445410	4640506	Pri	NS
ACR- 5	D	445171	4640646	Pri, T	NS
ACR- 6	D	445191	4640660	Pri	MC
ACR- 7	D	445209	4640669	Pri, T	MC
ACR- 8	D	445234	4640663	Pri	NS
ACR- 9	E	445082	4640610	Pri, T	NS
ACR- 10	E	445096	4640629	Pri, T	MC
ACR- 11	E	445066	4640624	Pri, V	MC
ACR- 12	E	445082	4640651	Pri	NS
ACR- 13	R	444233	4641424	Pri	NS
ACR- 14	R	444272	4641413	Pri, V	MC
ACR- 15	R	444251	4641439	Pri, T	MC
ACR- 16	R	444270	4641436	Pri, T	NS
ACR- 17	S	444150	4641511	Pri, T	NS
ACR- 18	S	444226	4641460	Pri, T	MC
ACR- 19	S	444197	4641497	Pri	MC
ACR- 20	S	444212	4641489	Pri, V	NS
ACR- 21	F	445044	4640631	Alt, T*	NS
ACR- 22	F	444982	4640618	Alt, V*, T*	MC
ACR- 23	M	444684	4641162	Alt, V*, T*	NS
ACR- 24	M	444697	4641187	Alt, T*	MC
ACR- 25	P	444482	4641383	Alt	MC
ACR- 26	P	444440	4641366	Alt, V*	NS
ACR- 27	T	444145	4641530	Alt	MC
ACR- 28	T	444135	4641578	Alt, V*	NS

Notes:
Polygon A – U - 100-meter blocks in alphabetical order starting at the southern end of the study area
Alt - Alternate sampling location
MC - Main channel
NS - Near shore
Pri - Primary sampling location
T - Toxicity test sampling location
T* - Alternate toxicity test sampling location, only if needed
V - Vertical profile sampling location
V* - Alternate vertical profile sampling location, only if needed
Coordinates are in UTM NAD83 meters zone 16N.
Samples are listed in most downstream to most upstream locations.

Enclosure A
Photo Log of Source Area Features

Photo 070710-01: Medium-sized, dry pipe south of General Iron (GI) processing plant. S. Meyer, July 7, 2010.

Photo 070710-02: Loading chute over at GI; combined sewer overflow (CSO) outfall nearby, according to City of Chicago. S. Meyer, July 7, 2010.

Photo 070710-03: Metals Management scrap yard on west side of river. S. Meyer, July 7, 2010.

Photo 070710-04: CSO outfall #080, “netted”, medium-sized, northeast corner of Cortland Avenue Bridge. S. Meyer, July 7, 2010.

Photo 070710-05: CSO outfall #078, medium sized; brick building and palette loading at this property. S. Meyer, July 7, 2010.

Photo 070710-06: Small, historic outfall, grown over with vegetation; steel guardrail at land edge here. S. Meyer, July 7, 2010.

Photo 070710-07: Small, historic outfall, vegetation growing out of it. S. Meyer, July 7, 2010.

Photo 070710-08: Box culvert, southeast corner of Webster Avenue Bridge, CSO/storm sewer; aeration station upstream of here. S. Meyer, July 7, 2010.

Photo 070710-09: Crane/clamshell hoist at shore just north of aeration station. S. Meyer, July 7, 2010.

Photo 070710-10: Small, orange, clay (?), drain tile under tree roots at shoreline. S. Meyer, July 7, 2010.

Photo 070710-11: Very large, two-box storm/CSO outfall with control gates at southeast corner of Fullerton Avenue Bridge. S. Meyer, July 7, 2010.

Photo 070710-12: Small (6-inch) outfall in concrete block near treated wood bridge; maybe creosote source. S. Meyer, July 7, 2010.

Photo 070710-13: Large, box “overflow” under same wood bridge of photo 070710-12; parking lot upland from here. S. Meyer, July 7, 2010.

Photo 070710-14: Small (4-6 inch) pipe from crumbling concrete foundation. S. Meyer, July 7, 2010.

Photo 070710-15: Small outfall just upstream of concrete/foundation block; maybe PVC.
S. Meyer, July 7, 2010.

Photo 070710-16: Cement facility with large loading dock; barges docked here, wall/outfalls not visible.
S. Meyer, July 7, 2010.

Photo 070710-17: CSO #079, large (2-foot diameter), southwest corner of Courtland Avenue Bridge; Metals Management scrap metal yard downstream of here. S. Meyer, July 7, 2010.

Photo 070710-18: Medium-sized (18-inch) metal pipe approximately 20 feet south of downstream end of Metals Management scrap yard wall; stormwater seepage over seawall. S. Meyer, July 7, 2010.

Photo 070710-19: Medium-sized (18-inch) outfall on sheet pile wall. There is another similar outfall just south of here. S. Meyer, July 7, 2010.

Photo 070710-20: Medium (1-foot diameter) outfall at ComEd facility. S. Meyer, July 7, 2010.

Photo 070710-21: Medium-sized outfall with water running from it (maybe ComEd). S. Meyer, July 7, 2010.

Photo 070710-22: Large, corrugated metal outfall underneath a foundation, partially obstructed by wood seawall. S. Meyer, July 7, 2010.